

REMARKS

Claims 12-44 are pending.

Claims 12 and 29 are independent claims.

Claims 12 and 29 are amended.

Applicants respectfully submit that the pending claims are patentable over the prior art.

I. CLAIM REJECTIONS 35 U.S.C. § 102(e)

Claims 12-25 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,985,762 (hereinafter "Geffken"). Applicants respectfully traverse this rejection.

Applicants respectfully submit Geffken does not appear to show all claim features of independent claim 12. However, solely to expedite prosecution, Applicants have amended independent claim 12 to recite, among other things, "etching the first portion of the diffusion barrier at the bottom of a via while depositing a second portion of the diffusion barrier, other than the etched first portion, elsewhere on the substrate (emphasis added)." This amendment has been made to make explicit what was implicit and is not meant to narrow the scope of the claims.

The present invention, as embodied by independent claim 12, provides for the deposition of a first portion of a diffusion barrier followed by the separate step of simultaneous etching of the first portion and deposition of a second portion (*which is not the first portion*). Applicants describe a specific, non-limiting example of this in Applicants' Specification at Page 14, line 33 to Page 15, line 10. Here, Applicants show how a first

portion of the diffusion barrier may be deposited by applying no wafer bias. After "several seconds or more" a wafer bias may be applied and simultaneous etching of the first portion and deposition of the second portion may occur. The material etched from the bottom of the via includes material from the first deposition. Additional material (e.g., a second portion of the diffusion barrier) is deposited as the originally deposited material (e.g., a first portion of the diffusion barrier) is etched. See also, Applicants' Specification, Page 13, line 17 to Page 14, line 32.

In contrast, Geffken appears to show etching the diffusion barrier, wherein some of the etched material may be unintentionally re-deposited elsewhere on the substrate. See Geffken, Col. 1, line 66 to Col. 2, line 2 and Col. 2, lines 49-57. In Section 3a of the current Office Action, the Examiner states Geffken shows etching the first portion of the diffusion barrier at the bottom of a via while depositing a second portion of the diffusion barrier elsewhere on the substrate at Col. 2, line 1. However, this section of Geffken discusses "sputtered re-deposited copper on the via sidewalls, (emphasis added)" (from the bottom of the via), not deposition of a second portion of a barrier layer. Here, the copper is not a portion of a barrier layer (Geffken describes appropriate diffusion barrier materials at Col. 2, lines 36-44), rather it is the material which the diffusion barrier is designed to keep from contacting the inter-level dielectric (Geffken, Col. 2, lines 44-48). Even if other material from the diffusion barrier is similarly re-deposited on the via sidewalls, Geffken does not appear to show "etching the first portion of the diffusion barrier at the bottom of a via while

depositing a second portion of the diffusion barrier, other than the etched first portion, elsewhere on the substrate," as recited in amended independent claim 12. Accordingly, as Geffken does not appear to show all features of the present claims, Applicants respectfully request the Examiner reconsider and withdraw the 35 U.S.C. § 102 rejection of independent claim 12.

Claims 13-25 are dependent on amended independent claim 12 and are submitted as allowable for at least the same reasons as claim 12.

Accordingly, reconsideration and withdrawal of the 35 U.S.C. § 102 rejection is respectfully requested.

II. CLAIM REJECTIONS 35 U.S.C. § 103(a)

Claims 26-44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Geffken in view of U.S. Patent Application No. 2002/0060363 (hereinafter "Xi"). Applicants respectfully traverse this rejection.

As Xi is a continuation-in-part with a filing date of January 17, 2002, it is unclear whether the subject matter the Examiner cites can claim priority to the earlier U.S. Patent Application No. 08/856,116.

Further, the claimed invention and Xi were, at the time the invention of this application was made, owned by (or subject to a duty of assignment to) Applied Materials, Inc., the assignee of this application. It is noted that Xi qualifies as prior art relative to this application, if at all, only under subsection (e) of 35 USC §102. Accordingly, pursuant to 35 USC §103(c), Xi is disqualified from being used in a rejection under 35 USC §103 against the claims of this application. (See MPEP Sec.

706.02(1)(2)). It is therefore requested that the rejection of claims 26-44 under 35 USC §103(a) based on the Xi reference be reconsidered and withdrawn.

V. Conclusion

The Applicants believe all the claims are now in condition for allowance, and respectfully request reconsideration and allowance of the same.

A separate Request for Three-Month Extension of Time is enclosed. Please charge the Three-Month Extension fee to deposit account No. 04-1696. Applicants do not believe any other fees are due regarding this amendment. If any other fees are required, however, please charge Deposit Account No. 04-1696. The Applicants encourage the Examiner to telephone Applicants' attorney should any issues remain.

Respectfully Submitted,



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